DOCUMENT RESUME

ED 255 025 EC 172 084

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TITLE Implementing an Adaptive Physical Education Program for Educable Mentally Retarded Children, Kindergarten through Third Grade.
PUB DATE Aug 83
NOTE 43p.; Ed.D. Practicum Report I, Nova University.
PUB TYPE Reports - Descriptive (141) -- Dissertations/Theses - Practicum Papers (043)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Adapted Physical Education; *Mild Mental Retardation; *Motor Development; Primary Education; Program Effectiveness

ABSTRACT

An adaptive physical education program was implemented for two special classes of educable mentally retarded children, grades K-3 in California. Children from a regular kindergarten class also participated in the program. The program operated for 5 months, with children receiving motor skills training 40 minutes per day, 4 days per week. Analysis of pre- and post-test scores on the Bruininks-Oseretsky Test of Motor Proficiency revealed that Ss increased skills in seven of the eight subtests with a statistically significant increase in strength. Normal kindergarteners who participated in the program increased skills in six subtests with statistically significant increases in running speed and agility and in strength. Student interest and participation in the program were high. (CL)

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IMPLEMENTING AN ADAPTIVE PHYSICAL EDUCATION PROGRAM FOR EDUCABLE MENTALLY RETARDED CHILDREN, KINDERGARTEN THROUGH THIRD GRADE

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NOVA UNIVERSITY

IMPLEMENTING AN ADAPTIVE PHYSICAL EDUCATION PROGRAM FOR EDUCABLE MENTALLY RETARDED CHILDREN, KINDERGARTEN THROUGH THIRD GRADE

PRACTICUM REPORT I SUBMITTED
TO THE FACULTY OF THE EARLY
CHILDHOOD EDUCATION PROGRAM
IN CANDIDACY FOR THE DEGREE OF

DOCTOR OF EDUCATION

BY

MIMI KELLER

NOVA UNIVERSITY

CLUSTER 12

August 25, 1983

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ED 172084

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SEP 29 1983

Abstract

Implementing an Adaptive Physical Education Program for Educable Mentally Retarded Children, Kindergarten through Third Grade.
Mimi Keller, 1983: Practicum Report, Nova University
Ed.D. Early Childhood Education Program
Descriptors: Adaptive Physical Education/Motor Development/Psychomotor Objectives/Psychomotor Skills/Movement/Perceptual Motor Learning/Playground Activities/Physical Education/Special Education

With cutbacks in funds, fewer Adaptive Physical Education (A.P.E.) teachers, larger caseloads, and less equipment, it was impossible to meet the physical education needs of all handicapped children in Los Angeles County. The primary goal of this practicum was to implement an A.P.E. program for two special classes for educable mentally retarded children, kindergarten through third grade, at Roosevelt Elementary School in Paramount California. Children from a regular kindergarten class also participated in the program. A second goal was to determine whether or not there was significant improvement in students' motor skills after participation in the A.P.E. program.

The program was implemented for five months. Children received training in the development of motor skills 40 minutes per day, four days per week.

The Bruininks-Oseretsky Test of Motor Proficiency was used as the pre- and posttest measure of fine and gross motor skills. Special class children increased skills in seven of the eight subtests with a statistically significant increase in Strength. Kindergarten children increased skills in six of the eight subtests with statistically significant increases in Running Speed and Agility and in Strength. They demonstrated a significant loss of skills in Response Speed which remains unexplained.

Chapter 1

Introduction

Roosevelt School is one of eight elementary schools in the Paramount Unified School District. It has an enrollment of 775 students, kindergarten through fifth grade, as well as two special education classes serving 21 educable mentally retarded children, kindergarten through third grade. The facility is new, having been dedicated in October, 1981.

The city of Paramount is located approximately 15 miles southeast of Los Angeles and has a population of 36,000. It has a Council-Manager type of government. There are 500 manufacturing plants in the area, with automotive, sports equipment, pipe products, and furniture manufacture leading the list. The city has one general hospital, three convalescent hospitals, 22 physicians, three dentists, two optometrists, and one Los Angeles County Health Clinic. In addition to the eight elementary schools, there are two junior high schools, one high school, one continuation school, and two parochial schools. The community has 33 churches, one library, five parks, and nine playgrounds. The socio-economic status of the population ranges from low to middle class (Community Economic Profile, 1981). Once of Dutch heritage, the

city is rapidly changing to a predominantly Mexican-American community. For example, 75% of the children attending Roosevelt School are Spanish speaking.

The writer is one of two special education teachers at Roosevelt School. Her class serves nine educable mentally retarded children and one autistic child. All children are between two and four years below grade level in academic achievement and intellectual functioning. There is one full-time teacher's aide in the classroom. The writer, the other special education teacher, and one kindergarten teacher overlap teaching time in an effort to team-teach and mainstream some of the handicapped children.

As case carrier for each child in her class, the writer's responsibilities include the chairing of the IEP (Individualized Education Plan) meeting with the parents and other professionals, such as the school administrator, school psychologist, speech and language specialist, and nurse; the writing of academic and behavioral goals and objectives for each student; the implementation of a program designed to meet these goals and objectives; and participation on the Child Study Team at the school site to help place children with exceptional needs in an appropriate educational setting.

Chapter 2

Study of the Problem

In 1967 physical education became mandatory for all students, regardless of physical condition, in California public schools (Dexter, 1970, 1973). Since that time there have been many changes in adaptive physical education (A.P.E.) for handicapped students. Some confusion has revolved around the definition of "severe" as used in Instruction of Physically Handicapped Pupils in Remedial Physical Education (Dexter, 1970, 1973). According to this booklet a pupil is eligible for A.P.E. if a physician makes a diagnosis of one or more of the following conditions: (1) serious impairment of locomotion, (2) severe sensory impairment, (3) severe cardiovascular, respiratory, or glandular condition, (4) severe postural condtion, and (5) other severe physical condition. Because of the uncertainty about the meaning of "severe," it was necessary to write new guidelines. During this time all special education students in public schools in Los Angeles County were provided A.P.E. services. These programs were double-taxed, receiving funds from both the state and county. There was money available for A.P.E. teachers and equipment. Three years ago in Los

Angeles County there were 85 A.P.E. teachers with $1000 per year/per teacher for equipment. Due to recent cutbacks in funding, Los Angeles County employed only 56 A.P.E. teachers with $350 per year/per teacher for equipment during the 1982-1983 school year. Duplicated students, i.e., those already in public school special education programs, no longer figured in funding for A.P.E. Los Angeles County A.P.E. teachers were faced with an average caseload of 55 students, while some had caseloads as high as 90. By law all elementary school students must have 200 minutes of physical education for every 10 school days. Because of the heavy caseloads and lack of funds the A.P.E. teachers were unable to meet this requirement. In the writer's class (1982-1983) for educable mentally retarded students, kindergarten through third grade, two children were receiving county operated A.P.E. services for 30 minutes per week, whereas three years ago all of her students received the 200 minutes for every 10 school days required by law. In light of these changes it has become necessary for the special class teacher to implement the A.P.E. program.

The problem, then, was that because of decreased funding the Los Angeles County A.P.E. program could no longer meet the requirements for instruction to special class students

in the public schools.

Barber (1982), in a memo to Special Education Local Plan Area Administrators, stated that according to the California Administrative Code (C.A.C.), Title 5 regulations, effective March 5, 1982, A.P.E. was described as providing for "...individuals with exceptional needs who require development or corrective instruction and who are precluded from participation in the activities of the general physical education program, modified general physical education program, or in a specially designed physical education program in a special class" (p. 1).

A physician's note was no longer sufficient to inusre eligibility for A.P.E. Instead, a multidisciplinary assessment was required, with ultimate placement in the least restrictive environment. The California Association for Health, Physical Education, Recreation and Dance has developed a physical education program matrix which defines children recommended for A.P.E. placement as exhibiting (1) physical disability (e.g., paraplegia, hemiplegia, quadriplegia) which requires significant modification of activities, and/or (2) physical disability which requires extreme care and allows only limited participation in selected activities (Barber, 1982). This definition eliminates all children with moderate or mild handicapping conditions from A.P.E.

An interview with the Area Program Administrator in Adaptive Physical Education confirmed the fact that a problem existed and that the children were the ones being hurt. The importance of A.P.E. in the development of perceptual-motor skills and sound bodies must not be underestimated. With cutbacks in funds, fewer A.P.E. teachers, larger caseloads, and less equipment, it was impossible to meet the needs of all handicapped children in Los Angeles County.

Literature Review

Historical Comments

Throughout history philosophers and educators have recognized the importance of physical education. Hall (1981) compiled historical quotations which cite the importance placed on body movement. She quoted Aristotle, "...the majority of games are imitations of work and actions which will be used in later life"; Comenius, "...intellectual progress is conditioned to every step by bodily vigor. To attain the best results, physical exercise must accompany and condition mental training"; Rousseau, "...if you would cultivate the intelligence of your pupil, cultivate the power that it is to govern.

Give his body continual exercise, make him robust and sound in order to make him wise and reasonable"; G. Stanley Hall, "...for the young, motor education is cardinal, and is now coming in due recognition, and for all, education is incomplete without a motor side for muscle culture develops brain centers as nothing else yet demonstrably does"; and John Dewey, "...experience has shown that when children have a chance at physical activities which bring their natural impulses into play, going to school is a joy, management is less of a burden, and learning easier."

More recently Arnheim and Sinclair (1975) concluded that a rich environment of movement and sensory opportunities is much more important to the young child than the forced mental discipline of developing academic skills. They maintained that denying young children the right to move by placing them in an unnatural, highly structured atmosphere with an emphasis on small-muscle control often creates a dislike for school.

Definition and Theories of Perceptual-motor Development

Perceptual-motor development is defined as an organization of interpretation of sensory data with related voluntary motor responses (Hall, 1981). Many theorists have contributed to the field of perceptual-motor development.

Piaget considered the sensorimotor stage of development as underlying all operational intelligence. Preschool and elementary school teachers are influenced directly by Piaget and realize that a child with inadequate experience at the sensorimotor level may have difficulty adapting to the school environment. These teachers are usually concerned with the child's motor behavior (Furth, 1970).

According to Frostig (1973), the teaching of movement skills and creative movement enhances the total development of the child--his physical and psychological abilities, his feelings about himself and about others. In short, movement education affects how the child adapts to and masters his environment. The development of motor skills is a central goal in movement education, but movement education can also help the child to communicate better, to perceive more accurately, and to become more adept at problem solving. Although movement education is certainly necessary and important for all children, it is of special importance for children with handicaps because these children so often have deficits in movement, in their ability to perceive and to process information from the world around them, and in their awareness of their own bodies. Because movement education helps these children to develop lagging abilities it is most important for children with learning difficulties.

Behavior modification is another method which has shown positive results in the control of inappropriate behavior in play activities. The basic tenet of this technique, developed by Skinner (1968), is that the human organism will not repeat behaviors for which it is not rewarded. This method enables the instructor to identify maladaptive behaviors which interfere with learning and aid the child to develop more socially acceptable behaviors. While many special educators have made use of this classroom management technique, few have applied its principles to their physical education program.

Kephart (1960) is one of the pioneers of perceptual-motor training as a means of increasing a child's academic potential and remediation of learning disorders. He is a developmentalist who maintains that child behavior is based on early motor responses and that more complex behavior evolves out of less complex behavior. His basic concepts are discussed in detail in his book, The Slow Learner in the Classroom. Kephart believes that if learning is to take place effectively, perception and movement must be matched, a process that occurs through a wide variety of sensory experiences and movement opportunities.

Other theorists in the field of perceptual-motor training are Getman, Barsch, Delacato, and Cratty. Getman suggests that visual perception can be developed through motor training. Basic components of his program include general coordination activities, balance, eye-hand coordination, eye movement, form recognition, and visual memory (Gearheart, 1973). Use of the walking beam, chalkboard, and templates, along with exercises for eye control and eye-hand coordination, are characteristic of both the Getman and Kephart approaches.

Barsch (1973) stated that the teacher can relate cognitive movement throughout the whole curriculum rather than it being something done between 9:00 and 9:30 every morning. Movement experiences can be used in all academic areas, so that what looks like physical education is actually aimed at increasing the children's whole range of activities, at broadening their world, and enriching their lives. Barsch maintained that all programs designed to help children must be perceptual, movement oriented, and linguistic.

Delacato's system is one of neurological organization (LeWinn, 1966), and is used with children having severe brain damage and/or behavioral disorders as well as those with severe learning disabilities. The central

theme of neurological organization is establishing normal patterns of motor behavior by a system of passive or active movements based on normal reflex behavior. Delacato indicates that the majority of learning and behavioral disorders in children are the result of brain lesions and should be remedied by a program of organizing the nervous system through basic movement patterns and sensory stimulation. His theory is controversial and has come under sharp criticism.

Cratty (1967) is director of the Perceptual-Motor Learning Laboratory at the University of California, Los Angeles and is a prolific writer in the area of motor learning. He is known as a critic of the many claims that have been made by the devotees of perceptual-motor systems. Cratty does not regard movement as the primary basis for mental, social, and emotional development but considers it one facet in the child's total development. He sees movement experiences as potentially powerful tools, however, in developing a sense of belonging and recognition for educationally handicapped children who are below average in gross-motor skills (Cratty, 1973).

> Activities to enhance balance, body-perception, thinking, ball catching and throwing, agility, locomotor behavior, manual dexterity, and the like

> should be among the underpinnings of every program of physical education, and of most programs of special education, particularly when the children evidence moderate to severe movement and/or learning problems (Cratty, 1967, p V).

Waite (1971) agrees that the social development of the handicapped child is aided by a regular physical education program. In her book, The Educable Mentally Retarded Child: Guidance and Curriculum, she emphasized the importance of providing for the educable mentally retarded child's physical growth as well as his mental growth.

Evidence (Arnheim & Sinclair, 1975; Edson, 1973) indicates the importance of motor development in young handicapped children. Poor motor development must not be taken lightly. It could compound the personal and emotional problems of the handicapped child. The Adaptive Physical Education program provided an environment in which the child experienced success and developed self-confidence and movement efficiency.

In summary, most educators would agree that physical education is an integral part of the total educational process. Early childhood is the most advantageous time to identify children who have movement problems. The physical educator or classroom teacher is in the best

possible position to recognize these problems. When a child is observed to move with difficulty, diagnostic testing should follow and a prescriptive program planned (Arnheim & Sinclair, 1975).

Instrumentation and Lesson Plans

For the purpose of this practicum the Bruininks-Oseretsky Test of Motor Proficiency was administered to measure the fine and gross motor skills of the children involved in the program. The test, described in more detail in Chapter 3, was published in 1978 and was strongly recommended by the Los Angeles County Adaptive Physical Education Department for use in this program. Although the test is relatively new, some research has already been published.

Fine (1979) reviewed the test by addressing three questions: (1) for which population is the test appropriate, and can it be legitimately used for various populations? (2) what is the purpose of the test as related to its content and the author's stated purpose? and (3) who should administer the test? After a brief description of the test and some words of caution concerning the use of the instrument with children exhibiting specific neuromuscular or skeletal problems, Fine answered the three questions: (1) the test can be used in assessing

serious motor dysfuntions and developmental handicaps in children, (2) a broad variety of purposes is suggested including making decisions about educational placement, assessing fine and gross motor skills, and screening for special purposes, and (3) valid inferences from the test depend on the experience and background of the examiner. Fine also stated that the Bruininks is good as a pre- and posttest tool for a research project or evaluation of a treatment. Fine's review gave the writer more confidence in using the instrument with young educable mentally retarded children.

Although the Bruininks was designed for use with children aged 4½ to 14½ years, Beitel and Mead (1980) found it to be a viable measure for 3 to 5 year old children. They administered the test to 24 children 3 to 5 years of age to assess its potential for discriminating among ages and between sexes. The short form and the eight subtests were significantly related to age, and so the test can be regarded as age-related through the 3-5 year range. No significant sex differences were found on either the short form or on the subtest scores. Evidence supports use of the Bruininks as a viable measure of motor proficiency in children 3-5 years of age. The mental ages of some of the special class students at Roosevelt School fall within this range.

The test can be used with handicapped populations, as domonstrated by Brunt and Broadhead (1982) in their work with deaf children. Their study extended the available body of knowledge by highlighting sex and chronological age traits on the Bruininks and by making visual comparisons with the mean performance of normal children. The short form of the test was administered to 154 deaf or hard of hearing children 7-14 years old and their performance was compared with that of the normal children in the original national standardization sample for the test. Isolated sex differences were noted. Girls aged 7 scored significantly higher on Upper Limb Speed and Dexterity. On 8 test items for girls and 11 for boys mean performance improved with age. Performance on items of static and dynamic balance for deaf boys and girls was noticeably inferior to that of normal children at all age levels. On items of Visual-Motor Control, however, the performance of deaf children was superior to that of normal children.

A study by Krus, Bruininks, and Robertson (1981) found that the intercorrelations among the subtests indicated a greater differentiation of motor abilities with increasing age. Factor analysis of subtest items supported the grouping of items, and factor analysis

of subtests isolated two significant dimensions, Factor I, balance and coordination, and Factor II, speed, precision, and strength.

Beitel and Mead (1982) evaluated the Bruininks to determine test-retest reliability. The test-retest reliability was very high, r=.96.

In a pilot study by Broadhead (1982) to assess the Bruininks for placement of mentally retarded children in A.P.E. programs the test was found to be 74.6% accurate. It was used for placing and individually instructing handicapped children in self-contained classrooms.

Resources for lesson plans for the practicum were recommended by a Los Angeles County Adaptive Physical Education teacher. The following were used extensively: Action in Learning (Langhorst & McPherson, 1974) and Easy Movin' (Anderson & Urbina, 1980). These guides consist of various activities which encourage the development of the body as well as enrichment of perception and cognition. Basically, they are designed for early childhood development, particularly kindergarten and first grade, but both can be used with learning disabled children who are older chronologically but immature neurologically. In fact, the rationale for Action in Learning is to meet the needs of learning disabled children.

Langhorst and McPherson state that the awareness of educators regarding the numbers of learning disabled children has resulted in the development of special programs, such as theirs, to meet the needs of these children. Their program features rhythm, gross motor, fine motor, body image, space and direction, balance, auditory, visual, tactual, gustatory, and olfactory experiences. The book is divided into two sections: classroom activities and physical education activities. There are 74 classroom sessions planned and 48 physical education sessions.

Easy Movin' (Anderson & Urbina, 1980) is divided into 10 color-coded sections with activities for balance, eye-foot coordination, eye-hand coordination, learning games, movement exploration, music and dance, sensory motor coordination, strength and endurance, total body coordination, and inclement weather activities. A list of equipment is included with suggestions for homemade and purchased equipment.

Chapter 3

Anticipated Outcomes and Evaluation Instruments

The primary goal of this practicum was to implement an A.P.E. program for two special classes for educable mentally retarded children, kindergarten through third grade, at Roosevelt Elementary School in Paramount, California. Children from a regular kindergarten class were also to participate in the program.

A second goal of the practicum was to determine whether or not there was significant improvement in student's motor skills after participation in the A.P.E. program. The means of evaluating whether this goal had been met was to pretest and posttest the children with the Bruininks-Oseretsky Test of Motor Proficiency. The pretest took place in January, 1983 and the posttest in May, 1983.

The behavioral objective was as follows: students will demonstrate improved fine and gross motor skills as measured by the pre- and posttests with the Bruininks-Oseretsky Test of Motor Proficiency.

The Bruininks (1978) assess both fine and gross motor skills and provides three summary scores: (1) Gross Motor Composite, (2) Fine Motor Composite, and

(3) Battery Composite. The test was developed by Robert H. Bruininks and is based in part on the adaptation of the Oseretsky Tests of Motor Proficiency (Doll, 1946). It was designed to assist educators, clinicians, and researchers in assessing motor skills of individual students aged 4½ to 14½ years of age. The complete battery is made up of eight subtests and 46 separate items (Appendix A). Normative data, based on a sample of over 700 children, include standard scores for each age group, percentile ranks, and stanines.

Test equipment is designed to interest children and to provide uniform testing conditions. Examiners do not need formal training, but should become thoroughly familiar with the instructions for administration and should practice giving the test in simulated situations before actually administering it.

The eight subtests assess the following aspects of motor development:

(1) Running Speed and Agility (one item). This subtest measures running speed during a shuttle run.

(2) Balance (eight items). Three items assess static balance by requiring the subject to maintain balance while standing on one leg. Five items assess performance balance by requiring the subject

to maintain balance while executing various walking movements.

(3) Bilateral Coordination (eight items). Seven items assess sequential and simultaneous coordination of the upper limbs with the lower limbs. One item assesses coordination of upper limbs only.

(4) Strength (three items). This subtest assesses arm and shoulder strength, abdominal strength, and leg strength.

(5) Upper-Limb Coordination (nine items). Six items assess coordination of visual tracking with movements of the arms and hands. Three items assess precise movements of arms, hands, or fingers.

(6) Response Speed (one item). This subtest measures the ability to respond quickly to a moving visual stimulus.

(7) Visual-Motor Control (eight items). This subtest measures the ability to coordinate precise hand and visual movements.

(8) Upper-Limb Speed and Dexterity (eight items). This subtest measures hand and finger dexterity, hand speed, and arm speed.

The Gross Motor Composite summarizes performance on subtests 1-4; the Fine Motor Composite summarizes performance on subtests 5-8; and the Battery Composite

summarizes performance on all eight subtests. Individual record forms were kept for each child. Copies of the Individual Record Form and Student Test Booklet are given in Appendix A and Appendix B.

Chapter 4

Solution Strategy

Four possible solutions to the problem were identified:

(1) Because the cutbacks in funding were most directly responsible for the problem, one possible solution was to increase state and county funding. During this time of rapid inflation, unemployment, and budgetary constraints it was unlikely that more money would be spent on A.P.E. programs.

(2) Alternatively, Los Angeles County could have provided inservice training for special education teachers in A.P.E. Special class teachers could then implement their own A.P.E. programs. This possibility was being considered at the county level, but no decision had been made.

(3) A third possiblity was that special class children who were able could be mainstreamed into regular class P.E. programs. This, however, would still leave those less able, but not disabled enough for A.P.E., without a P.E. program.

(4) A fourth possible solution would require the special class teacher to implement his or her own A.P.E. program. In this way all special class children would

receive regular instruction in physical education that could be designed to meet the needs of individual children while being monitored by the teacher. When possible, special classes at the same school could combine to make optimum use of time, instruction, and equipment.

The solution implemented was the fourth listed above. It was feasible for one of the special education teachers to plan a structured A.P.E. program for the students of two special classes. The program was implemented immediately after the pretesting, regularly, and without additional funds or staff training.

The writer was responsible for implementation of the program. The Bruininks-Oseretsky Test of Motor Proficiency (1978) was administered to assess the fine and gross motor skills of 21 special class children and 24 kindergarten children. The kindergarten children provided a mainstreaming opportunity for the special class children and also a non-disabled comparison group. A closely related study is Bruininks and Bruininks' (1977) comparison of 55 learning disabled and 55 non-disabled students. These investigators reported that learning disabled students were significantly poorer than non-disabled students in over-all motor performance.

The children participated in the A.P.E. program Tuesday through Friday, 12:40-1:20 p.m. This schedule provided 320 minutes of P.E. for every 10 school days, which exceeded the mandated minimum of 200 minutes for every 10 school days.

Assessment of the special class and kindergarten children began January 17, 1983 and was completed January 31, 1983. Four testing stations were set up each day in order to administer four items of the subtests per day. Each station was directed by one of the special class teachers or a teacher's aide. The children were divided into four small groups and moved from station to station. It took 11 school days to complete the testing. Children who were absent during those days were given make-up tests as soon as they returned to school. The posttest took place May 9-23, 1983.

Parental consent was not necessary for implementing the P.E. program because it was a mandated part of the public school day. However, all parents were informed of the program by letter (Appendix C), with an invitation to contact the writer if they had any questions.

Equipment such as a balance beam, hula hoops, parachute, climbing equipment, and balls were available at the school site. A local tire agency donated used tires for the obstacle course. Ropes were purchased. Material

such as balloons, bells, buttons, chalk, dowels, flannel board, tape, newsprint, pencils, and crayons were already in the classroom. A metronome, which was required for some activities, was borrowed from the music department.

Chapter 5

Results, Conclusions and Recommendations

The A.P.E. program was implemented from January 31 to May 9, 1983. Activities were planned for developing the following skills: running speed and agility, balance, strength, upper limb coordination, bilateral coordination, visual motor control, and upper-limb speed and dexterity. One or two skills were practiced daily. The kindergarten class was divided into two groups with these groups alternating in attendance for the A.P.E. session. Special class students participated at all times.

The pretests and posttests were administered as planned with make-up tests given later to a few students who had been absent and missed one of more sessions.

Because some families moved out of the district and some special class students were placed in other programs (e.g., aphasia, autism) the numbers decreased from 21 special class children and 24 kindergarten children at the time of the pretest to 16 and 20 children, respectively, for the posttest.

Originally, the three summary scores (Gross Motor Composite, Fine Motor Composite, and Battery Composite) were to be subjected to statistical analysis to determine

whether participation in the A.P.E. program resulted in a significant improvement in the student's motor skills. Specifically, the mean standard scores on the pretest and the posttest were to be compared, using *t* tests for dependent samples.

However, the performance of many of the students in the special education classes was below the lowest level for which composite standard scores are reported in the test manual. Since the manual does provide standard scores for even the lowest possible level of performance on each of the eight subtests that comprise the complete battery, the decision was made to analyze these scores instead. Primarily to facilitate the analysis, but also because of doubts that the data for the students in the special education classes satisfied the normality assumption underlying the *t* test, the decision was also made to switch to a nonparametric method, the sign test.

If participation in the A.P.E. program had no effect we would expect that by chance alone as many children would "lose" as would "gain" from the pretest to the posttest. The question addressed by the sign test is whether the difference between the numbers of "gainers" and "losers" is too great to be attributed to the effects of chance. (The answer to this question is probably of

greater practical significance than the answer to the question addressed by the t test, viz., is the difference between the pretest and posttest means too great to be attributed to chance.) Children who neither gained nor lost on a particular subtest were excluded from the analysis of the data for that subtest.

The results are summarized in Table I. It can be seen that for the students in the special classes, the number of "gainers" exceeded the number of "losers" on all but one subtest (Response Speed), but that the difference was statistically significant only on Bilateral Coordination. For the kindergartners, the number of "gainers" exceeded the number of "losers" on six of the eight subtests, and the differences were significant on both Running Speed and Agility, and on Strength. On Response Speed, the number of "losers" significantly exceeded the number of "gainers".

It is not surprising that the performance of many of the special class students was below the lowest level for which composite standard scores are reported in the test manual. Rarick (1973; Rarick, Widdop & Broadhead, 1970; Francis & Rarick, 1960) found similar results in research on a national sample of 4200 educable mentally retarded children. According to his study, such children

Table I

Numbers of Special Class and Kindergarten "Gainers" and "Losers" on Eight Subtests of Bruininks-Oseretsky Test of Motor Proficiency

	Special Class (N=16)			Kindergarten (N=20)		
Subtest	Gainers	Losers	p	Gainers	Losers	p
Running Speed and Agility	8	3	ns	18	2	<.001
Balance	9	5	ns	12	4	ns
Bilateral Coordination	13	2	<.01	12	5	ns
Strenght	10	5	ns	18	2	<.001
Upper-Limb Coordination	10	3	ns	9	10	ns
Response Speed	5	6	ns	2	17	<.001
Visual Motor Control	7	6	ns	14	5	ns
Upper-Limb Speed and Dexterity	6	1	ns	14	5	ns

are on the average two to four years below the performance level of intellectually normal children. He attributes this deficit to a lack of opportunity rather than to any fundamental motoric disability and cites public apathy and lack of trained instructional personnel as contributing factors. Bruininks and Bruininks (1977) and Orfitelli (1977) support Rarick's findings.

Although not statistically significant, in most cases there was improvement in fine and gross motor skills, and so the behavioral objective of the practicum was met. Without a control group for comparison it is difficult, if not impossible, to say that the implementation of the program was responsible for the improvement. It is important to note, however, that the age difference for each child from January to May was taken into account in the scoring of the tests; therefore, one could assume that a child who was in the A.P.E. program and showed more than five months growth had, in fact, increased his or her motor skills by participation in the program. It would be of interest to replicate the program, including a control group.

The one unanticipated outcome of the practicum was the significantly lower scores of the kindergarten children on Response Speed. Without practice one would expect

the scores to remain approximately the same from pretest to posttest. The significantly lower scores remain unexplained.

Student interest and participation in the program were extraordinary. Often the first question asked in the morning was, "What's for P.E. today?" Although most of the activities were noncompetitive, a kickball tournament was scheduled which created much excitement in selecting teams, team colors, and cheerleaders. Five children who did not wish to play on a team became cheerleaders and were encouraged to exercise by doing jumping jacks, kicks, arm movements, etc. All five asked to play on a team before the tournament was over!

In light of the goals and objectives of the program having been met, the data analyzed, and the enthusiastic response of the children, this practicum experience is judged to have been a success. Because of the high interest and increase in motor skills it is recommended that the program continue. The acquisition of more P.E. equipment will be necessary and with careful planning should be possible within the confines of the special education budget.

As the program was underway interest was generated among other primary class teachers. Questions were

raised about the A.P.E. program and requests were made for activities requiring little or no equipment. As a result the enclosed P.E. booklet was designed and distributed to all kindergarten through third grade teachers at Roosevelt School.

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APPENDIX C

November 8, 1982

Dear Parents,

This is to inform you that the children in the classes of Mrs. Gibson, Mrs. Kissel, and Mrs. Keller will be participating in a Physical Education (P.E.) program taught by Mrs. Keller. The children will be given the Bruininks-Oseretsky Test of Motor Proficiency before the P.E. program begins and again when the program is completed. We will play games, exercise, and practice fine and gross motor skills.

If you have any questions about the P.E. program please call Mrs. Keller at Roosevelt Elementary School, 630-3131, extension 354.

Sincerely,

Mrs. Keller